

What is claimed is:

1. A disc presentation apparatus comprising:
a frame supporting an in-feed conveyor advancing a disc caddy confining a disc;
5 a caddy escapement supported by the frame comprising an active clamp bar confining the disc caddy adjacent said conveyor, and a mechanism securing the disc caddy from said conveyor; and
a caddy feed comprising a feed elevator supported by the frame and a caddy gripper attached to the feed elevator, the caddy gripper gripping the disc caddy from the mechanism, and wherein the caddy gripper secures and aligns the disc caddy in a predetermined orientation, and further in which the feed elevator advances the disc caddy secured by the caddy gripper, thereby presenting the disc at a predetermined substantially fixed location.
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2. The apparatus of claim 1, in which the frame further supports an alignment assembly comprising:
a main mount with a first main shaft aperture confined by the frame;
a compression spring with a second main shaft aperture adjacent the main
20 mount;
a feed mount plate with an attached main shaft support adjacent the compression spring;
a main shaft extending through the main shaft support, each of the said main shaft apertures and adjustably secured to the main mount;
25 a side adjustment nut slidably engaging the main shaft and pressingly engaging the feed mount plate; and
a shaft support adjacent the side adjustment nut and secured to the main shaft, wherein the side adjustment nut selectively positions the feed mount plate relative to the frame in a first lateral direction over a
30 spring range of the compression spring, the compression spring restrains rotation of the feed mount plate about the main shaft, and an interaction between the side adjustment nut and the compression

spring selectively determines the first lateral direction of the feed mount plate relative to the frame.

3. The apparatus of claim 2, the alignment assembly further
5 comprising:
a stabilizer bar secured to the feed mount plate;
an adjuster block affixed to the stabilizer bar;
a slide assembly secured to the feed mount plate;
a feeder mount table attached to the slide assembly; and
10 a table lock affixed to the slide assembly and adjustably secured to the feed
mount plate, the slide assembly selectively positions the feeder
mount table relative to the feed mount plate in a second lateral
direction different than the first lateral direction relative to the
frame, wherein the table lock secures the feed mount table in a
15 determined position relative to the feed mount plate, and wherein
the adjuster block communicating with the feed mount table
provides pitch adjustment of the feed mount table relative to the
frame.
- 20 4. The apparatus of claim 1, the caddy escapement further comprising:
an escapement mount plate attached to the frame;
a caddy present sensor supported by the escapement plate detecting
presence of the disc caddy;
a pneumatically operated slide assembly responsive to the caddy present
25 sensor positioning the active clamp bar in pressing contact with the
disc caddy; and
a barcode reader attached to the escapement plate determining a disc type
of the disc.

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5. The apparatus of claim 1, in which the mechanism is a caddy vacuum attachment comprising:

- 5 a guided cylinder affixed to an escapement mount plate, the escapement mount plate attached to the frame while supporting a caddy present sensor;
- a caddy vacuum-grasp mounting plate attached to the guided cylinder;
- a vacuum-grasp support plate secured to the caddy vacuum-grasp mounting plate;
- a disc retention mechanism mounted to the vacuum-grasp support plate;
- 10 a vacuum-grasp assembly mounted to the vacuum-grasp support plate; and
- a disc scanner attached to the caddy vacuum-grasp mounting plate detecting presence of the disc caddy, wherein the guided cylinder responding to the caddy present sensor positions the vacuum-grasp assembly adjacent the disc caddy, the vacuum-grasp assembly grasping the disc caddy.
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6. The apparatus of claim 5, in which the disc retention mechanism comprises:

- 20 a disc retainer side mount attached to the vacuum-grasp support plate;
- a disc retainer slide attached to the disc retainer side mount;
- a disc retention bar mount secured to the disc retention slide; and
- a disc retention bar affixed to the disc retention bar mount, wherein the disc retainer slide positions the disc retention bar adjacent the disc.

25 7. The apparatus of claim 5, in which the vacuum-grasp assembly comprises:

- a slide rail fastened to the caddy vacuum-grasp mounting plate;
- a vacuum cup mount plate fixed to the slide rail;
- a vacuum cup adapted to the vacuum cup mount plate; and
- 30 a caddy bottom support joined to the vacuum cup mount plate, wherein the slide rail pressingly engages the vacuum cup into mating contact with a side of the disc caddy while sliding the caddy bottom support into supporting contact with a bottom of the disc caddy, and

wherein the vacuum cup grasps the side of the disc caddy while the caddy bottom support supports the bottom of the disc caddy.

8. The apparatus of claim 1, wherein upon the caddy escapement
5 positioning the disc caddy adjacent the caddy gripper, the caddy gripper grips the disc caddy from the mechanism, and in which the caddy gripper comprises:
a slide mount supported by the caddy elevator;
a gripper slide assembly attached to the slide mount;
a gripper plate secured to the gripper slide assembly;
10 an active jaw assembly fastened to the gripper plate; and
a caddy locating assembly supported by the gripper plate, wherein upon positioning of the caddy adjacent the caddy gripper, the gripper slide assembly advancing the gripper plate into mating contact with the disc caddy, the caddy locating assembly aligning the disc caddy
15 relative to the gripper plate, and the active jaw assembly engaging a first side of the disc caddy thereby gripping the disc caddy adjacent the gripper plate.

9. The apparatus of claim 8, in which the gripper slide assembly
20 comprises:
an arm pivot block attached to the slide mount;
a pivot cylinder affixed to the arm pivot block;
a pivot pin communicating with the arm pivot block and responsive to the pivot cylinder; and
25 a gripper slide supported by the pivot pin and attached to the gripper plate, wherein upon the jaw assembly gripping the disc caddy, the gripper slide retracts the disc caddy from the caddy escapement, and the pivot cylinder rotates the pivot block thereby aligning the disc caddy for presentation of the disc.

10. The apparatus of claim 8, in which the active jaw assembly
30 comprises:
a first jaw portion affixed to the gripper plate;

a jaw slide attached to the gripper plate; and
a second jaw portion secured to the jaw slide, wherein upon advancement
of the gripper plate into mating contact with the disc caddy, the jaw
slide advances the second jaw portion into an active clamping
engagement with the first side of the disc caddy thereby gripping
the disc caddy between the first and second jaw portions and
adjacent the gripper plate.

11. The apparatus of claim 8, in which the caddy locating assembly
comprises:
a datum slide assembly attached to the gripper plate;
a datum actuator plate secured to the datum slide assembly;
an activation linkage communicating with the datum actuator plate;
a datum bar movably affixed to the activation linkage;
a datum cylinder mounted to the gripper plate and affixed to the datum
actuator plate; and
an optical sensor mounted to the gripper plate detecting a position of the
datum bar, wherein upon advancement of the gripper plate into
mating contact with the disc caddy, the datum cylinder advances the
datum actuator plate which interacts with the activation linkage
thereby advancing the datum bar into engagement with a second
side of the disc caddy thereby aligning the disc caddy relative to the
gripper plate, wherein the optical sensor determines compliance of
the datum bar relative to the disc caddy.

12. The apparatus of claim 8, in which the caddy gripper further
comprises:
an over-travel vane attached to the gripper plate;
a sensor mount secured to the gripper slide;
an over-travel slide affixed between the gripper plate and secured to the
gripper slide; and
an over-travel sensor mounted to the sensor mount, wherein upon
encountering an encumbered travel of the disc caddy during

indexing of the disc caddy by the feed elevator, the over-travel vane activates the over-travel sensor, the over-travel sensor signals the feed elevator, and the feed elevator suspends indexing of the disc caddy.

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13. The apparatus of claim 1 further comprising an out-feed conveyer supported by the frame, the out-feed conveyer communicating with the caddy gripper transferring the disc caddy from the caddy feed.

14. An apparatus for gripping a disc caddy comprising:
a slide mount;
a gripper slide assembly attached to the slide mount;
a gripper plate secured to the gripper slide assembly;
5 an active jaw assembly fastened to the gripper plate; and
a caddy locating assembly supported by the gripper plate, wherein the
gripper slide assembly advances the gripper plate into mating
contact with the disc caddy, the caddy locating assembly aligning
the disc caddy relative to the gripper plate, and the active jaw
10 assembly engaging a first side of the disc caddy thereby gripping
the disc caddy adjacent the gripper plate.
15. The apparatus of claim 14, wherein the disc caddy confines a disc,
and in which the gripper slide assembly comprises:
15 an arm pivot block attached to the slide mount;
a pivot cylinder affixed to the arm pivot block;
a pivot pin communicating with the arm pivot block and responsive to the
pivot cylinder; and
a gripper slide supported by the pivot pin and attached to the gripper plate,
20 wherein upon the jaw assembly gripping the disc caddy, the gripper
slide repositions the disc, and the pivot cylinder rotates the pivot
block thereby aligning the disc caddy for presentation of the disc.
16. The apparatus of claim 14, in which the active jaw assembly
25 comprises:
a first jaw portion affixed to the gripper plate;
a jaw slide attached to the gripper plate; and
a second jaw portion secured to the jaw slide, wherein upon advancement
by the gripper slide assembly of the gripper plate into mating
30 contact with the disc caddy, the jaw slide advances the second jaw
portion into an active clamping engagement with a first side of the
disc caddy thereby gripping the disc caddy between the first and
second jaw portions and adjacent the gripper plate.

17. The apparatus of claim 14, in which the caddy locating assembly comprises:

- a datum slide assembly attached to the gripper plate;
- a datum actuator plate secured to the datum slide assembly;
- 5 an activation linkage communicating with the datum actuator plate;
- a datum bar movably mounted to the activation linkage;
- a datum cylinder affixed between the gripper plate and the datum actuator plate; and
- an optical sensor mounted to the gripper plate detecting a position of the
- 10 datum bar, wherein upon advancement of the gripper plate into mating contact with the disc caddy, the datum cylinder advances the datum actuator plate which interacts with the activation linkage thereby advancing the datum bar into engagement with a second side of the disc caddy thereby aligning the disc caddy relative to the
- 15 gripper plate, wherein the optical sensor determines compliance of the datum bar relative to the disc caddy.

18. The apparatus of claim 14 further comprising:

- an over-travel vane attached to the gripper plate;
- 20 a sensor mount secured to the gripper slide;
- an over-travel slide affixed between the gripper plate and the gripper slide;
- and
- an over-travel sensor mounted to the sensor mount, wherein upon an
- encumbered movement of the disc caddy, the over-travel vane
- 25 activates the over-travel sensor, and the over-travel sensor suspends the encumbered movement of the disc caddy.

19. A method comprising:
positioning a disc caddy confining a disc on an in-feed conveyor;
securing the disc caddy with a caddy escapement;
transferring the disc caddy secured by the caddy escapement to a caddy
5 feed;
extracting the disc caddy from the caddy escapement with means for
gripping a disc caddy;
indexing the disc to a predetermined substantially fixed location; and
transferring the disc caddy to an out-feed conveyor.

10 20. The method of claim 19, in which the means for gripping a disc
caddy comprises:
a slide mount;
a gripper slide assembly attached to the slide mount;
15 a gripper plate secured to the gripper slide assembly;
an active jaw assembly fastened to the gripper plate; and
a caddy locating assembly supported by the gripper plate comprising:
a datum slide assembly attached to the gripper plate;
a datum actuator plate secured to the datum slide assembly;
20 an activation linkage communicating with the datum actuator plate;
a datum bar movably mounted to the activation linkage;
a datum cylinder affixed between the gripper plate and the datum
actuator plate; and
an optical sensor mounted to the gripper plate detecting a position
25 of the datum bar, wherein the gripper slide assembly
advances the gripper plate into mating contact with the disc
caddy, the caddy locating assembly aligning the disc caddy
relative to the gripper plate, and the active jaw assembly
engaging a first side of the disc caddy thereby gripping the
30 disc caddy adjacent the gripper plate, and wherein upon
advancement of the gripper plate into mating contact with
the disc caddy, the datum cylinder advances the datum
actuator plate which interacts with the activation linkage

thereby advancing the datum bar into engagement with a second side of the disc caddy thereby aligning the disc caddy relative to the gripper plate, wherein the optical sensor determines compliance of the datum bar relative to the disc caddy.

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21. An apparatus presenting a disc confined by a disc caddy comprising a caddy vacuum attachment securing the disc caddy, and means for presenting the disc at a predetermined substantially fixed location.

- 5 22. The apparatus of claim 21, in which the means for presenting the disc at a predetermined substantially fixed location comprises a feed elevator supporting a caddy gripper comprising:
- a slide mount supported by the caddy elevator;
 - a gripper slide assembly attached to the slide mount;
 - 10 a gripper plate secured to the gripper slide assembly;
 - an active jaw assembly fastened to the gripper plate; and
 - a caddy locating assembly supported by the gripper plate, the gripper slide assembly advancing the gripper plate into mating contact with the disc caddy, the caddy locating assembly aligning the disc caddy
 - 15 relative to the gripper plate, and the active jaw assembly engaging a first side of the disc caddy thereby gripping the disc caddy adjacent the gripper plate.